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EXAMINER

QUASH, ANTHONY G

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 06/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/726,225

Applicant(s)

HENSON ET AL.

Examiner

Anthony Quash

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-44, 46-47 is/are rejected.
- 7) ☒ Claim(s) 45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date see inside.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statements (IDS) submitted on 8/1/05, 6/17/05, 6/6/05, 4/11/05, 8/3/04, and 4/15/04 have been considered by the examiner.

### ***Specification***

The disclosure is objected to because of the following informalities: On page 1 lines 8-18 of applicants' specification, the applicants have listed several related applications being identified by applicants' attorney docket numbers. It is request that the applications be identified by their US Patent/Patent Application numbers and not applicants' attorney docket numbers. Appropriate correction is required.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

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be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3,6-7,9,38 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3,5-6,8,31-35 of copending Application No. 10/726,257. Although the conflicting claims are not identical, they are not patentably distinct from each other because they claim the same subject matter.

Claim 1 of the present application corresponds to claim 1 of application 10/726,257.

Claim 2 of the present application corresponds to claim 2 of application 10/726,257.

Claim 3 of the present application corresponds to claim 3 of application 10/726,257.

Claims 6-7 of the present application correspond to claims 5-6 of application 10/726,257.

Claim 38 of the present application corresponds to the combination of claims 31,34-35 of application 10/726,257.

Claims 1-2 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1,3,20 of copending Application No. 10/869236. Although the conflicting claims are not identical, they are not patentably distinct from each other because they claim the same subject matter.

Claim 1 of the present application corresponds to claims 1 and 20 of application 10/869236.

Claim 2 of the present application corresponds to claims 3 of application 10/869236.

Claims 1-2,6,25,38 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2,5,6-7,14,25 of copending Application No. 10/869,237. Although the conflicting claims are not identical, they are not patentably distinct from each other because they claim the same subject matter.

Claim 1 of the present application corresponds to claim 1 of application 10/869237.

Claim 2 of the present application corresponds to claim 2 of application 10/869237.

Claim 6 of the present application corresponds to claim 5 of application 10/869237.

Claim 25 of the present application corresponds to claim 14 of application 10/869237.

Claim 38 of the present application corresponds to claims 15 and the combination of claims 6 and 7 of application 10/869237.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 34-37 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure, which is not enabling. The structure of the vehicle headlight, dental curing apparatus, structure of the projection system, and structure of the LCD display are critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Claims 34-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It has been held that a recitation that vehicle headlight, dental curing apparatus, the projection system, the LCD display has not been given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2,5,22-23,36,38,42,43 are rejected under 35 U.S.C. 102(b) as being anticipated by Parker [6,224,216].

As per claim 1, Parker [6,224,216] discloses a plurality of solid state radiation source (72), a plurality of optical concentrators (100), wherein each concentrator receives radiation from a corresponding one of the solid state radiation sources, a plurality of optical waveguides (76), wherein each of the plurality of optical waveguides includes a first end and a second end, wherein each first end receives concentrated radiation from a corresponding concentrator; and a support structure (40,86, figs. 6-8) to stabilize the plurality of optical waveguides between the first and second ends.

As per claim 2, Parker [6,224,216] discloses the plurality of solid state radiation sources comprising a plurality of LED dies (72, col. 2 lines 55-65).

As per claim 5, Parker [6,224,216] discloses the plurality of waveguides comprise a plurality of polymer waveguides (col. 5 lines 25-31).

As per claim 22, Parker [6,224,216] discloses an optical element (44, col. 4 lines 30-65) to collect and distribute optical radiation from the optical waveguide second ends in a selected light distribution pattern (col. 4 lines 25-67, col. 7 lines 60 – col. 8 line 5).

As per claim 23, Parker [6,224,216] discloses each LED die being spaced apart from its nearest neighbor by a spacing length that is greater than a width of the LED die (figs. 3-4, col. 5 line 62 – col. 6 line 20).

As per claim 36, Parker [6,224,216] discloses that the being used to project light (col. 4 lines 15-25, 52-67).

As per claim 38, Parker [6,224,216] discloses a plurality of LED dies (72, abstract, figs. 6-7, col. 2 line 45 – col. 3 line 10), plurality of optical concentrators (100,102, figs. 6-7, col. 7 line 65 – col. 8 line 5), a plurality of optical fibers (76, figs. 6-7), a controller (56, fig. 2), coupled to the solid state light source, to selectively activate one or more groups of the plurality of LED dies (abstract, figs. 2,8-9, col. 7 line 65 – col. 8 line 5).

As per claim 42, Parker [6,224,216] discloses a first group of red emitting LED dies, a second group of blue emitting LED dies, and a third group of green emitting LED dies. See Parker [6,224,216] abstract, figs. 2,8-9, col. 2 line 55 – col. 3 line 20, col. 7 line 65 – col. 8 line 5).



As per claim 43, Parker [6,224,216] discloses the controller selectively activating a first LED die channel in response to a trigger signal. See Parker [6,224,216] col. 7 line 45 – col. 8 line 5).

Claims 1-2,25-28,30,38-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Hed [5,301,090].

As per claim 1, Hed [5,301,090] discloses a plurality of solid state sources (fig. 5, col. 4 lines 64-68, col. 5 lines 30-35, col. 6 lines 20-25), plurality of optical concentrators (74-76, col. 11 lines 25-35), a plurality of optical fibers (77-79, col. 11 lines 25-35), a controller (23, 52, 83, col. 4 lines 4-9, col. 5 line 65 – col. 6 line 8), a support structure (80,82) to stabilize the plurality of optical waveguides between the first and second ends.

As per claim 2, Hed [5,301,090] discloses the plurality of solid state radiation sources comprising a plurality of LED dies (col. 6 lines 20-25).

As per claim 25-26, Hed [5,301,090] discloses an interconnect circuit layer to provide electrical connection (34, col. 7 lines 1-34) to the plurality of LED dies, wherein the plurality of LED dies is arranged in a first grouping and a second grouping (col. 9 lines 1-15), wherein the first grouping of LED dies is connect to a first portion of the interconnect circuit layer and the second grouping of LED dies is connected to a second portion of the interconnect circuit layer (figs. 2-3, col. 3 lines 15-27, col. 4 lines 3-10,col. 11 lines 40-50). It also teaches the plurality of LED dies (figs. 2-3, 5) being further arranged in a third grouping of LED dies and the third grouping of LED dies being

connected to a third portion of the interconnect circuit layer (figs. 2-3, col. 3 lines 15-27, col. 4 lines 3-10, col. 11 lines 40-50).

As per claims 27-28, Hed [5,301,090] discloses a first output intensity of at least one LED die of the first grouping of LED dies being controllable separate from a second output intensity of at least one LED dies of the second grouping of LED dies (col. 4 lines 1-10, col. 5 lines 60 – col. 6 line 10, col. 8 lines 35-40, col. 9 lines 1-10).

As per claim 30, Hed [5,301,090] discloses the first group of LED dies comprise red emitting LED dies, wherein the second grouping of LED dies comprising blue emitting LED dies, and wherein the third grouping of LED dies comprise green emitting LED dies (figs. 2-3,5).

As per claim 38, Hed [5,301,090] discloses a plurality of LED dies (fig. 5, col. 4 lines 64-68, col. 5 lines 30-35, col. 6 lines 20-25), plurality of optical concentrators (74-76, col. 11 lines 25-35), a plurality of optical fibers (77-79, col. 11 lines 25-35), a controller (23, 52, 83, col. 4 lines 4-9, col. 5 line 65 – col. 6 line 8), coupled to the solid state light sources, to selectively activate one or more groups of the plurality of LED dies.

As per claim 39, Hed [5,301,090] discloses an interconnect circuit layer to provide electrical connection to the plurality of LED dies and electrically coupled to the controller (figs. 1-3,5, col. 5 lines 5-15, col. 7 lines 10-31), a heat sink (heat exchanger, 57), and a thermally conductive adhesive to thermally couple the interconnect circuit layer to the heat sink (col. 7 lines 55-69, col. 9 lines 65 - col. 10 line 15).

As per claim 40, Hed [5,301,090] discloses a fiber array connector (figs. 2-2b, col. 7 lines 1-32), a sheet (2, figs. 1,2-2b, col. 4 lines 63-68) to support the array of optical concentrators.

As per claim 41, Hed [5,301,090] discloses a support structure, having a first aperture to enclose a perimeter of the fiber array connector and a second aperture to stabilize the plurality of optical waveguides between the first and second ends. See Hed [5,301,090] figs. 2-2b.

Claims 1-2,35 are rejected under 35 U.S.C. 102(e) as being anticipated by Gofman [7,029,277].

As per claim 1, Gofman [7,029,277] discloses a plurality of solid state radiation sources (22), a plurality of optical concentrators (29, figs. 8a-8b), a plurality of optical waveguides (26), and a support structure (fig. 8a, col. 7 lines 4-17) to support the plurality of optical waveguides between the first and second ends.

As per claim 2, Gofman [7,029,277] discloses the solid state source comprising a plurality of LED dies (figs. 6a-6b, 8a-9).

As per claim 35, Gofman [7,029,277] discloses the light source being used for dental curing (abstract, col. 6 lines 5-15).

Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Spooner [2003/0233138].

As per claim 1-2, Spooner [2003/0233138] discloses a plurality of solid state radiation sources (24, paragraphs [0016,0048]), plurality of optical concentrators (paragraph [0012,0017,0048]), plurality of optical waveguides (28, paragraphs [0012,0016]), a support structure (paragraphs [0012-0013] to stabilize the plurality of optical waveguides between the first and second ends.

As per claims 2, Spooner [2003/0233138] discloses the radiation sources being LED dies (fig. 5b).

Claims 46-47 are rejected under 35 U.S.C. 102(e) as being anticipated by Stam [6,587,573].

With respect to claims 46-47, Stam [6,587,573] discloses a vehicular headlight illumination system comprising a solid state light source located in a first vehicle compartment to generate a selected illumination pattern, wherein heat generated by the solid state light source is distributed to a location apart from the first compartment. It also discloses the selected illumination pattern being steerable. See Stam [6,587,573] abstract, figs. 26a-28, 50b-50c, col. 7 lines 25-38, col. 46 line 60 – col. 47 line 15, col. 54 lines 15-23, 40 - col. 55 line 5, col. 56 lines 20-55, and col. 58 lines 7-13.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3,6-8,14,31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over in Gofman [7,029,277] view of Decaudin [6,692,250].

As per claim 3, Gofman [7,029,277] teaches an interconnect circuit layer (figs. 6a-6b) to provide electrical connection to the plurality of LED dies, wherein the dies are bonded thereon, and a heat sink (24, col. 6 lines 15-40). It also teaches a thermally conducting compound connecting the interconnect layer with the heat sink (figs. 6a-6b, col. 6 lines 15-40). However, it does not explicitly state that the thermally conductive layer be an adhesive. Decaudin [6,692,250] does teach an adhesive bonding being used to provide electrical connections between the diodes and the power supply (Decaudin [6,692,250] col. 4 lines 1-15). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the thermally conductive layer be an adhesive in order to bind the LED dies to the interconnect layer to prevent device from falling apart during packaging.

As per claim 6, Gofman [7,029,277] teaches the plurality of waveguides (61,26) comprise a plurality of optical fibers (61,26), the device further comprising a fiber array connector to support the first ends of the plurality of fibers in a defined pattern (fig. 8a).

As per claims 7,14, Gofman [7,029,277] teaches a housing comprising a first aperture to enclose a perimeter of the fiber array connector and a second aperture to enclose at least the first portion of the second ends of the fibers (fig. 8a).

As per claim 8, Gofman [7,029,277] teaches a third aperture to support a second portion of the second ends of the fibers (fig. 8a).

As per claim 31, Gofman [7,029,277] teaches the fiber array connector being adapted to engage in a receptacle (8a).

As per claim 32, Gofman [7,029,277] teaches the at least a portion of the plurality of LEDs comprising ultraviolet (ultraviolet wavelength is about 400 nm) emitting LED dies (col. 4 lines 30-35).

Claims 3-4, 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spooner [2003/0233138].

With respect to claims 3-4, Spooner [2003/0233138] teaches an interconnect circuit layer to provide electrical connections to the plurality of LED dies wherein the dies are bonded thereon (fig. 5b, paragraph [0055]), a heat sink (50, 54, paragraphs [0055]) wherein electrical leads are provided (paragraph [0055]). However, it does not explicitly state a thermally conductive adhesive to thermally couple the interconnect circuit layer to the heat sink. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a thermally conductive adhesive thermally couple the interconnect circuit layer to the heat sink in order to aid in the prevention of overheating the LEDs by conducting heat away from the LEDs. It also does not explicitly state that the circuit layer comprise a metal layer and a dielectric layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to circuit layer comprise a metal layer and a dielectric layer, since it has been held to be within the general skill of a worker in the art to select a known

material on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claim 17, Spooner [2003/0233138] teaches a fiber array connector to support the first ends of the plurality of optical fibers in a defined pattern, and a sheeting (plate) to support the array of optical concentrators (paragraphs [0012-0013,0017]).

With respect to claims 18-19, Spooner [2003/0233138] teaches a first alignment of the optical fibers the illumination device, wherein the interconnect layer, heat sink, fiber array connector and sheet each include alignment holes and include depression engageably matable with the protrusions (figs. 5b-5c, 7, paragraphs [0012-0013,0017-0018]).

Claims 24, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker [6,224,216].

As per claim 24, Parker [6,224,216] teaches all aspects of the claim except for explicitly stating that the spacing length being greater than or equal to six LED die widths. Parker [6,224,216] does however teach that that heat dissipation may play a role in determining the spacing and size of LEDs and/or the size and number of LED arrays that are employed (col. 6 lines 16-20). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the spacing length be greater than or equal to six LED die widths, in order to prevent overheating of the LEDs, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

As per claim 37, Parker [6,224,216] teaches all aspects of the claim except for explicitly stating that the photon emitting device be adapted for backlighting. However, it is the examiner's view that Parker [6,224,216] does imply this. Parker [6,224,216] explicitly teaches the light illuminating the back of a liquid crystal display (col. 4 line 30 – col.5 line 15). Therefore it is the examiner's view that Parker [6,224,216] teaches an equivalent structure known in the art.

Claims 3, 29,44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hed [5,301,090].

With respect to claim 3, Hed [5,301,090] teaches an interconnect circuit layer (figs. 2-3, col. 7 lines 10-32), a heat sink (heat exchanger, fig. 3, col. 9 line 65 – col. 10 line 15). However, it does not explicitly state a thermally conductive adhesive being thermally coupling the interconnect circuit layer to the heat sink. It would have been obvious to use a thermally conductive adhesive to couple the interconnect layer to the heat sink in order to aid in extending the life of the LEDs by helping to conduct heat away from the interconnect layer.

With respect to claim 29, Hed [5,301,090] teaches all aspects of the claim except for explicitly stating that the second ends of the second group of optical fibers emit radiation in a second direction different from a first direction of radiation emitted by the second ends of the first group of optical fibers. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the second ends of the second group of optical fibers emit radiation in a second direction different



from a first direction of radiation emitted by the second ends of the first group of optical fibers, since it has been held that rearranging parts of an invention involves only routine skill in the art.

With respect to claim 44, Hed [5,301,090] teaches all aspects of the claim except for explicitly stating that the controller increases the drive current to a first LED die channel to compensate for a reduced emission output from a second LED dies channel. Hed [5,301,090] does however teach adjusting the power the to the LEDs in order to modulate the chromaticity (col. 5 lines 5-15, col. 6 lines 45-54). Therefore, it is the examiner's view that Hed [5,301,090] teaches an equivalent of increases the drive current to a first LED die channel to compensate for a reduced emission output from a second LED dies channel since by adjusting the power to the LEDs in order to modulate for chromaticity, one is also adjusting the current to the LEDs.

Claims 9-12, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gofman [7,029,277] in view of Spooner [2003/0233138].

With respect to claim 9, Gofman [7,029,277] teaches all aspects of the claim except for explicitly stating a banding to surround and secure at least the first portion of the second ends of the fibers. Spooner [2003/0233138] does teach a banding to surround and secure at least the first portion of the second ends of the fibers (paragraphs [0012,0049]). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have a banding to

surround and secure at least the first portion of the second ends of the fibers in order to aid in preventing the dislodging of the optical fibers during movement.

With respect to claim 10, Gofman [7,029,277] teaches fixing at least a first portion of the second ends of the plurality of fibers in a selected pattern (col. 6 lines 15-40, col. 7 lines 1-16). However, neither Gofman [7,029,277] nor Spooner [2003/0233138] explicitly state the material that fixes the optical fibers being a polymer material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the material that fixes the optical fibers be a polymer material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

With respect to claim 11, Spooner [2003/0233138] teaches the fiber array connector groups the first ends of the plurality of optical fibers in a pattern and wherein the banding (bundling) fixes the first portion of the second ends of the plurality of optical fibers such that the plurality of optical fibers are uncrossed along a length of the plurality of optical fibers (figs. 2, 5b-6a, 8, paragraphs [0051, 0053]).

With respect to claim 12, Gofman [7,029,277] in view of Spooner [2003/0233138] teach all aspects of the claim except for explicitly stating that

Claims 6-9, 12-13, 15-16, 20-21, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hed [5,301,090] in view of Parker [6,224,216].

With respect to claim 6, Hed [5,301,090] teaches all aspects of the claim except for explicitly stating that the device further comprise a fiber array connector to support the first ends of the plurality of fibers in a defined pattern. Parker [6,224,216] does teach the device further comprising a fiber array connector to support the first ends of the plurality of fibers in a defined pattern (figs. 8-9, col. 7 lines 1-20, 45-67). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the device further comprise a fiber array connector to support the first ends of the plurality of fibers in a defined pattern in order to group fibers together that are transmitting light of the same color together and thereby aid in homogenizing the cumulative intensity of each intensity of each wavelength of light.

As per claim 7, Parker [6,224,216] teaches the support structure comprising a housing, wherein the housing comprises a first aperture to enclose a perimeter of the fiber array connector and a second aperture to enclose at least the first portion of the second ends of the fibers (figs. 2,8-9).

As per claim 8, Parker [6,224,216] teaches a third aperture to support a second portion of the second ends of the fibers (figs. 8-9).

As per claim 9, Parker [6,224,216] teaches a banding (bundling, 86) to surround and secure at least the first portion of the second ends of the fibers.

As per claim 12, Parker [6,224,216] teaches the second ends of the first portion provide output illumination in a first direction and the second ends of the second portion provide output illumination in a second direction different from the first direction (fig. 9).

As per claim 13, Parker [6,224,216] teaches the housing providing strain relief for the plurality of optical fibers (figs. 3,8).

With respect to claim 15, Hed [5,301,090] in view of Parker [6,224,216] teach all aspects of the claim except for explicitly stating that the support structure comprise molding epoxy disposed around and between at least a portion of the fibers. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the support structure comprise molding epoxy disposed around and between at least a portion of the fibers in order to aid in stabilizing the waveguides and heat dissipation.

As per claim 16, Parker [6,224,216] teaches the plurality of optical fibers comprise polymer coated clad silica fibers, the fibers having a core diameter of about 250 micrometers to about 1000 micrometers (col. 5 lines 25-31).

With respect to claims 20-21, Parker [6,224,216] teaches the plurality of fibers has shaped ends and non-shaped ends wherein the shaped ends direct light in a path different from the now shaped ends (fig. 9, col. 6 line 65 – col. 7 line18).

As per claim 33, Hed [5,301,090] teaches each LED die being in optical communication with a material to convert an output emission of the LEDs into a different color (col. 5 lines 35-45). However it does not state that the material being a phosphor material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the material be a phosphor material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

***Allowable Subject Matter***

Claim 45 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: With respect to claim 45, the prior art of record does not explicitly disclose nor teach the controller sending an increased drive current to a first LED die channel in response to an elevated temperature.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (571)-272-2480. The examiner can normally be reached on Monday thru Friday 9 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571)-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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